Fluid Mechanics Mid-term exam Fall semester 2011

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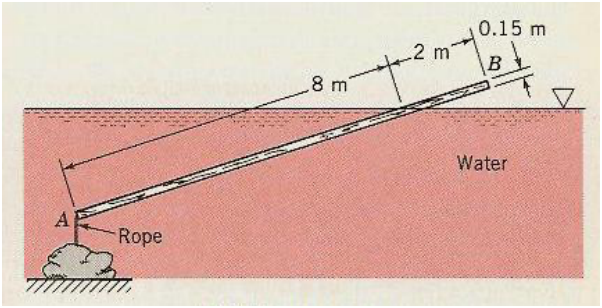
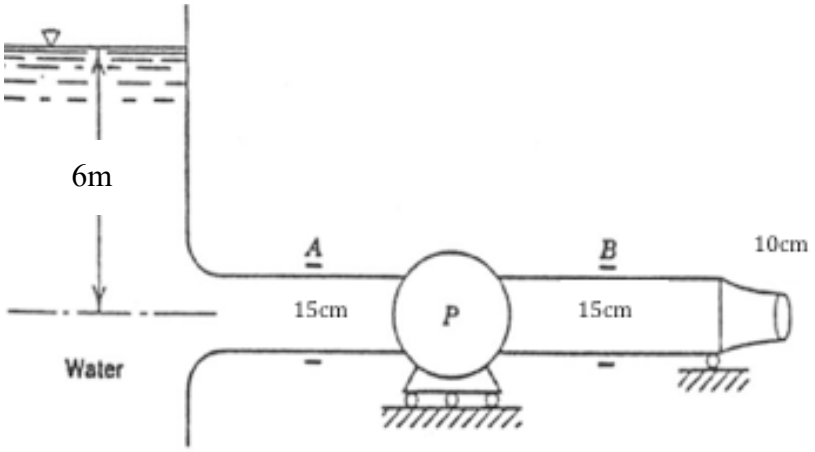
Student: ……..

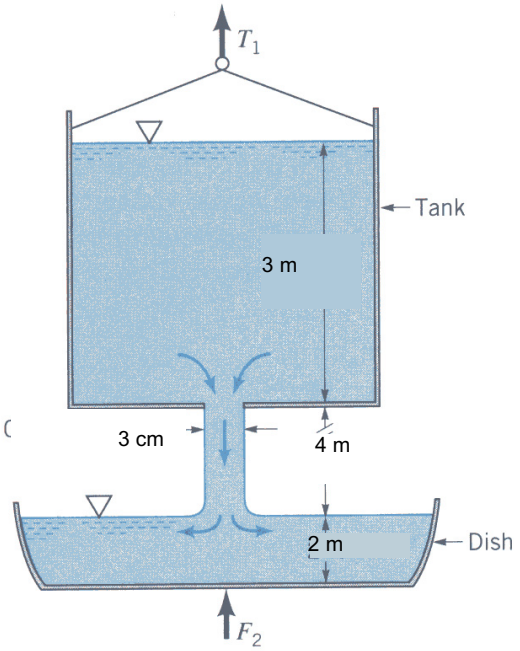
Problem 1 The homogeneous timber AB is 0.15 m by 0.30 m in cross section. Determine the specific weight of the timber and the tension in the rope.



Problem 2 When the pump is started, strain gages at *A* and *B* indicate longitudinal tension in the wall of the pipe of 100 N and 400 N, respectively. Assuming a frictionless system, calculate the flowrate and the pump power.



Problem 3 Water flows from a large tank into a dish as shown in the Figure. (a) If at the instant shown the tank and the water in it weigh 50 N, what is the tension, T_1, in the cable supporting the tank? (b) If at the instant shown the dish and the water in it weigh 80 N, what is the tension, F_2, needed to support the dish?



$g = 9.81\ m/s^2$
$\rho_{water} = 999\ kg/m^3$